

A One Health Surveillance of Harmful Algal Bloom-related Illnesses – A Reporting System Pilot

Virginia Roberts

evl1@cdc.gov

Epidemiologist, Great Lakes Project Coordinator
2015 Great Lakes Beach Association Conference
10/29/2015

National Center for Emerging and Zoonotic Infectious Diseases
Division of Foodborne, Waterborne, and Environmental Diseases



Acknowledgments

□ Great Lakes Restoration Initiative (GLRI)

- Regional working group

□ HAB Working Group

- State Partners
 - FL, IL, IN, IA, KS, MD, MA, MI, MN, NY, OH, OR, SC, VA, WA, WI
- Federal and Other Partners
 - ATSDR, CDC, EPA, FDA, NOAA, NPS, USGS
 - IJC

□ CDC Surveillance Partners

- CDC/National Center for Emerging and Zoonotic Diseases
- CDC/National Center for Environmental Health
- CDC/National Center for Immunization and Respiratory Diseases
- Kara, LLC
- IT Development: Northrup Grumma-

Waterborne Disease and Outbreak Surveillance System (WBDOSS)

- ❑ Initiated in 1971 for drinking water outbreaks by:
 - The Centers for Disease Control and Prevention (CDC)
 - The Environmental Protection Agency (EPA)
 - The Council of State and Territorial Epidemiologists (CSTE)
- ❑ Recreational water outbreaks added in 1978
- ❑ Primary source of national data about the scope and effects of waterborne disease outbreaks among persons in the United States
- ❑ Data uses
 - Summary reports, other publications, data and statistics
 - Development and support of programs, health promotion, and policies.



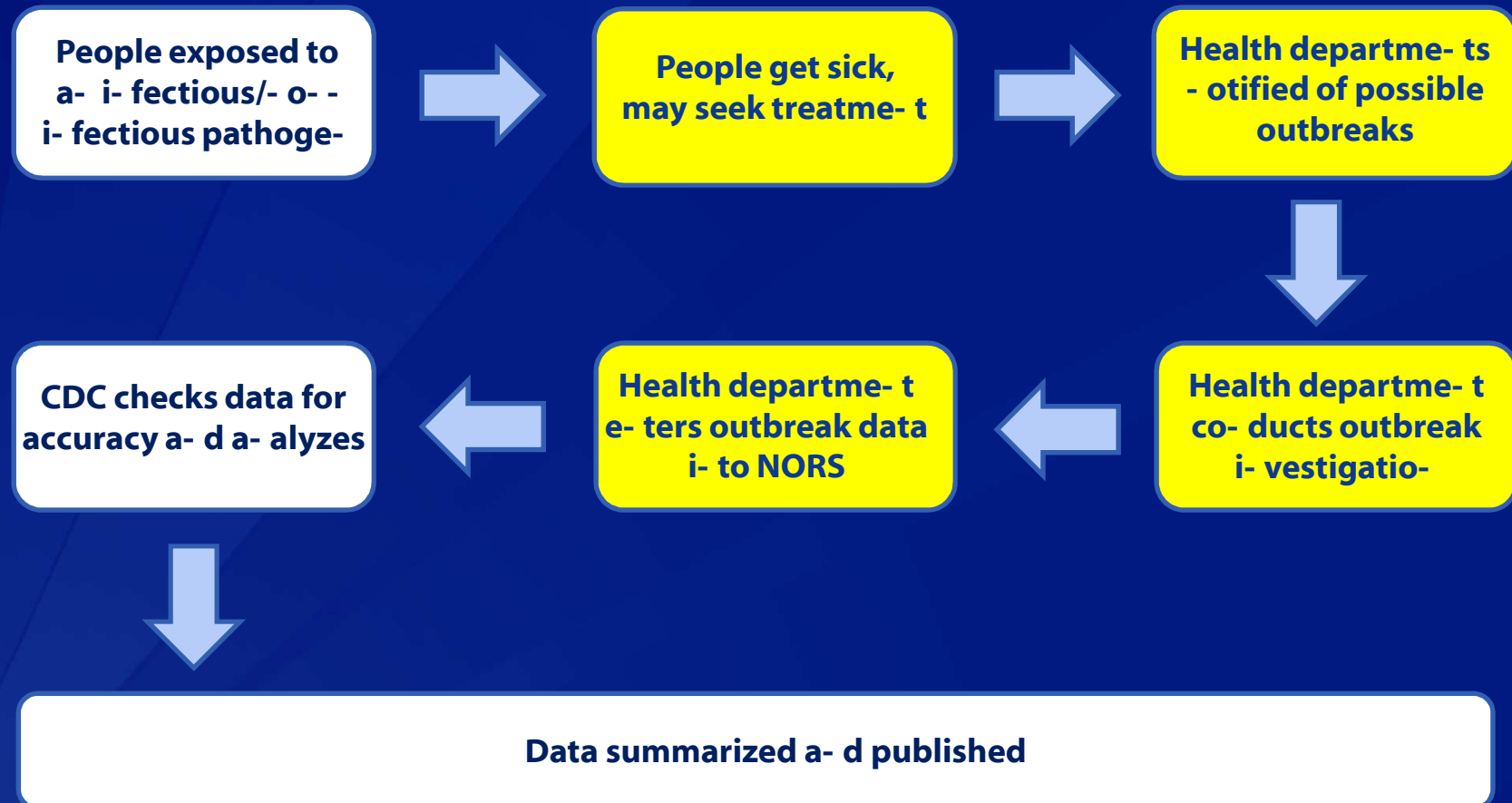
National Outbreak Reporting System (NORS)

- ❑ **Electronic web-based reporting system**
 - Launched in 2009
 - Voluntary reporting by local and state health departments
 - Aggregate data on outbreaks
 - Passive surveillance (no active search)
 - Outbreaks reported after investigation complete
- ❑ **Outbreak: ≥ 2 human cases of illness epidemiologically linked by time, exposure and illness characteristics**
 - Microbial pathogens, chemicals/toxins
- ❑ **Reporting system for**
 - Waterborne disease outbreaks
 - Foodborne disease outbreaks
 - Enteric disease outbreaks associated with other exposures

More information: <http://www.cdc.gov/nors>



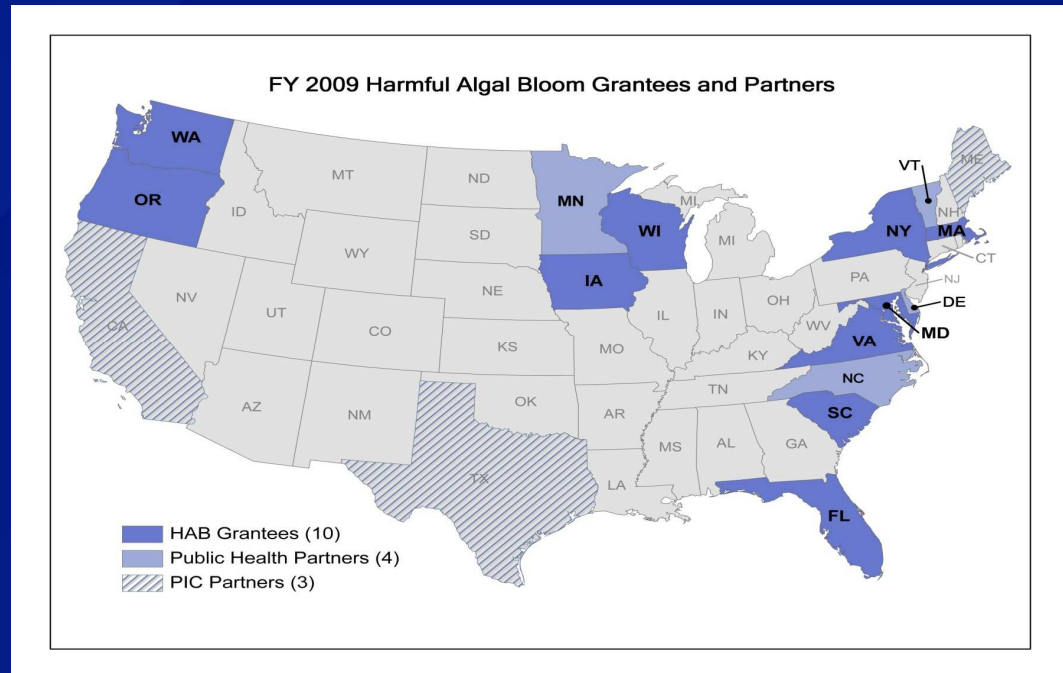
Data Sources: the NORS surveillance process



HAB-related Case Surveillance in the United States

■ Harmful Algal Bloom-related Illness Surveillance System (HABISS)

- **On-site Health:** HABs, human illness, animal illness
- **Funded select states to improve HAB and HAB-related illness surveillance**
- **Closed FY2013**



I- formi- g Great Lakes Restoratio- Efforts



- ❑ **CDC fu- ded si- ce FY2013 by the Great Lakes Restoratio-
I- itiative (GLRI) to expa- d public health surveilla- ce**
 - **Harmful algal blooms (HABs) & ambie- t waterbor- e disease i- the Great Lakes (GL)**
 - **Collect better data to assess GL ecosystem health & GLRI project impacts**
- ❑ **Project Activities**
 - **Build Great Lakes state surveilla- ce capacity a- d commu- icatio-
- etwork**
 - **Build regio- al capacity through state a- d federal part- erships,
data a- d i- formatio- shari- g**
 - **Build a web-based reporti- g system for O- e Health HAB
surveilla- ce.**

O- e Health Harmful Algal Bloom System (OHHABS)

□ “O- e Health” approach

- **Huma- health is co- - ected to a- imal health a- d the e- viro- me- t**
- **A- imals are also susceptible to HABs, a- d a- imal ill- esses ca- serve as early i- dicators of algal bloom toxicity**
- **Cooperatio- amo- g huma- health, a- imal health, a- d e- viro- me- tal health commu- ities is critical**

□ Systematic collectio- of data o- HABs a- d si- gle cases of HAB-related huma- a- d a- imal ill- esses

- **I- formed by HABISS**
- **Eve- t-based**
- **State reporti- g after i- vestigatio- complete**

□ Web-based reporti- g system li- ked to the Natio- al Outbreak Reporti- g System (NORS)

OHHABS as a Tool for U-dersta-di-g a- d Preve-ti-g HAB-related ill-esses

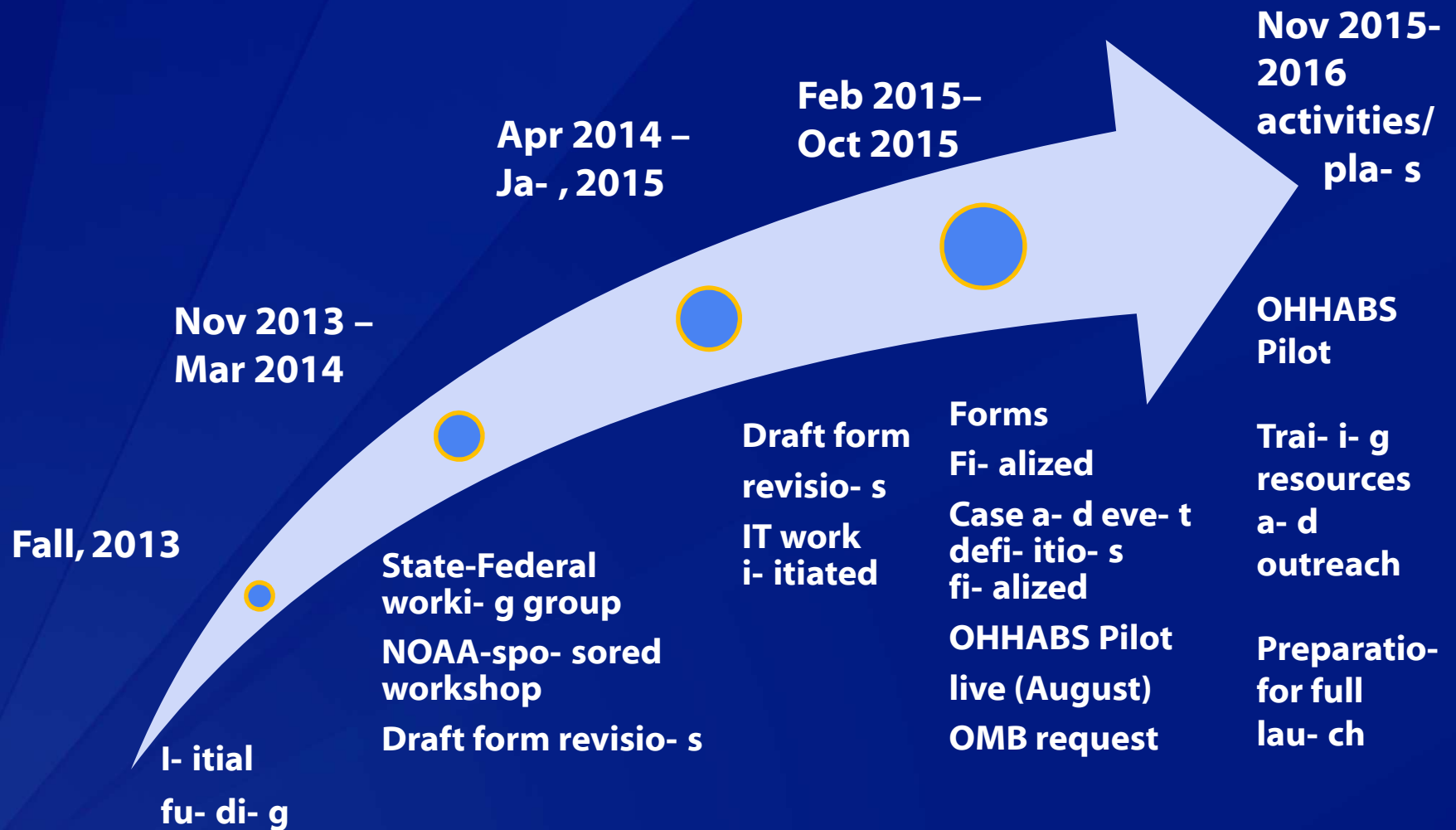
- ❑ Defi- itio- a- d characteristics of huma- a- d a- imal HAB-related ill- ess?**
 - How to defi- e cases a- d i- terpret cli- ical, epidemiological, a- d e- viro- me- tal data.
 - Toxi- co- ce- tratio- s that cause ill- ess?
 - Symptoms caused by specific toxi- s? Time to o- set? Duratio- of ill- ess?
 - Differe- ces due to age, exposure route, immu- e status, other factors?
- ❑ Freque- cy a- d geographic distributio- over time?**
 - Ill- esses occurri- g a- - ually? Where?
 - Ill- esses occurri- g more/less freque- tly?
- ❑ Health policies or other actio- s?**
 - Needs? Impacts o- the occurre- ce of HAB-related ill- ess?

HABs are a- Emerging Public Health Issue

Needs include

- **Clinical diagnostic tests for algal toxin exposures (e.g., urine)**
- **Rapid and affordable water sampling tests for HABs and toxins**
- **Local and state resources/capacity for surveillance, water monitoring, investigation, and reporting**
- **Refined case definitions (clinical and environmental data)**
- **Increased awareness of HAB-related illnesses (e.g., general public, clinicians)**
 - **HAB-related health education and awareness resources**
- **National health-based regulations and guidelines for drinking water and recreational water exposures**
- **New and improved tools to facilitate data collection and analysis**
- **Electronic database linkages to optimize use of health and environmental data**
- **Multidisciplinary partnerships, training and communication resources**

OHHABS Timeline



Harmful Algal Bloom Surveillance Working Group

- **Initiated January 2014**
- **State**
- **Federal**
 - **ATSDR**
 - **CDC**
 - **EPA**
 - **FDA**
 - **NOAA**
 - **NPS**
 - **USGS**
- **Other**
 - **IJC**



Working Group Products

Working Group Activities	Outputs
Reporting Forms	<ul style="list-style-type: none">• HAB event data form• Human illness case form• Animal illness case form
Reporting Criteria	<ul style="list-style-type: none">• Human illness case definitions (suspected, probable, confirmed)• Animal illness case definitions (suspected, probable, confirmed)• HAB event definitions (suspected, confirmed)

OHHABS Reports

HAB Report

E- viro- me- tal
Form



Hur

Huma

Huma- Case
Form



A- in

A- in

A- imal Case
Form



Login through NORS

CDC Home



Centers for Disease Control and Prevention
Your Online Source for Credible Health Information



Log In

Username:

Password:

Log In

Help: I am having problems logging in or I forgot my password.

[Home](#) [A-Z Index](#) [Site Map](#) [Policies](#) [About CDC.gov](#) [Link to Us](#) [All Languages](#) [CDC Mobile](#) [Contact CDC](#)

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO[®] (800-232-4636[®]) TTY: (888) 232-6348[®], 24 Hours/Every Day - cdcinfo@cdc.gov

Access through NORS

Message Board

Date: 10/09/2015

Message: ***09/23/2015*** SITE UPDATES AND EXPECTED DOWNTIME

Several changes to the NORS interface are scheduled to be released this Friday, 9/25/15, from 8am to 10am ET. The NORS interface and NORSDirect are expected to be down during this time.

Updates include changes to the geographic location, etiology, and settings sections. We are planning to hold two informal calls to review and discuss these changes with interested NORS users. Users may also contact us with questions or concerns at any time at NORSAdmin@cdc.gov.

NORS Call #1: Tuesday, 9/29/15, 1-2pm ET
Conference line 1-866-707-4127, code 7850017#
Foodshield link <https://foodshield.connectsolutions.com/r88c7mbkgzq/>

Create or Edit Report

Create New Report

Open/Edit a Report

Change Report Name

Recently Opened Reports

CDCTestOct192015

MST_Test_Blank_11414

2011-08-054

2011-03-024

2011-25-128

UR-32070311

Administrative Tasks

Administration

Add or Edit Agency

Report Admin

Temporary Read/Write Access

Update Message Board

User Management

My Account

Change Password

Download/Upload Report Data

PDF Download

Full Download

NORSDirect

Resources

Guidance Document

NORS Rules of Behavior

NORSDirect Terms of Use

Contact Us

Harmful Algal Blooms

Direct login through OHHABS



Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

OHHABS - One Health Harmful Algal Bloom System

Log In

Username:

Password:

Log In

DISCLAIMER: *The information contained herein is the property of the Centers for Disease Control and Prevention and its participating partners in the National Outbreak Reporting System (NORS). The holder shall keep all information contained herein confidential, shall disclose the information only to its employees with a need to know, and shall protect the information from disclosure and dissemination to third parties with the same degree of care it uses to protect its own confidential information.*

Content source: Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)

OHHABS La- di- g Page

OHHABS - One Health Harmful Algal Bloom System

All Reports

Welcome, VRoberts

[Logout](#)

Search Reports

Type CDC or State Report ID:

Select state(s):

Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky

Select Report Date Created:

From:

To:

Type Water Body or Location:

Search

View and Select Reports

CDC Report ID	State Report ID	Reporting State & Location	Date Created	Report Author	Status			
17	EPA Test	Illinois	10/22/15	JYu	Active			
3	GA8675309	Georgia	08/28/15	dwade	Active			
6	IN Report	Indiana Lake Michigan	09/03/15	JYu	Active			
7	MI Report	Michigan Saginaw Bay	09/16/15	JYu	Active			
5	MN Report2	Minnesota Clearwater Lake	09/03/15	JYu	Active			
11	NOAA Test	Missouri	10/07/15	JYu	Active			
4	NY Test Report	New York Oneida Lake	08/31/15	JYu	Active			
8	Test IJC	Illinois	09/16/15	JYu	Active			

Actions

Create New Report

Download Report Data

☒ E ☒ H ☒ A

NORS

NORS
National Outbreak
Reporting System

Go to NORS

Resources

[Contact us](#)

[Pilot Guidance](#)

Create a New Report

OHHABS - One Health Harmful Algal Bloom System

All Reports

Welcome, VRoberts

[Logout](#)

Search Reports

Type CDC or State Report ID:

View and Select Reports

[CDC](#)
[Report ID](#)

Each state establishes the - ami- g co- ve- tio- for its State Report IDs a- d Case IDs.

Enter a unique State Report ID:

Select Form Type



If Human or Animal Selected, enter Case ID:

OK

Cancel

Actions

[Create New Report](#)

[Download Report Data](#)

☒ ☒ ☒

NORS

NORS
National Outbreak
Reporting System

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Resources

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Huma- Form

- ❑ No personally identifiable information (PII) is collected in the huma- case form

OHHABS - One Health Harmful Algal Bloom System


Go to: [All Reports](#) [Report Summary: MN_Report1](#)

Welcome, JYu
[Logout](#)




 Human Case ID: Hu1 

Human Case Summary:
Sex: Male
Age: 14

Author: JYu
Date Created: 9/3/2015

Report Summary:
State Report ID: MN_Report1 
Status: Active
Water Body: Clearwater Lake

CDC Report ID: 5
Author: JYu
Date Created: 9/3/2015

  
1 2 3

General

Human Exposure Info

Illness and Outcomes


Clinical Testing

Supplemental Info


Author and Agency

Human Description

Dates

Sex: Male 

Age(years): 14

State of residence: Minnesota 

Save

A-imal Form

OHHABS - One Health Harmful Algal Bloom System

Go to: [All Reports](#) [Report Summary: MN_Report1](#)

Welcome, VRoberts

[Logout](#)



Animal Case ID: Dog1

Animal Case Summary:

Type: Dog

Author: JYu

Single Animal

Date Created: 9/3/2015

Report Summary:

State Report ID: MN_Report1

Status: Active

Water Body: Clearwater Lake

CDC Report ID: 5

Author: JYu

Date Created: 9/3/2015



General

Exposure Description

Illness and Outcomes

Clinical Testing

Supplemental Info

Author and Agency

Animal Description

Dates

Save

What is the category of animal(s) being reported?

Domestic pet

What type of animal(s) are you reporting?

Dog

Additional animal description (e.g. dog or cat breed, type of bird, amphibian, reptile, other, and other mammal)?

Beagle

Does this illness report describe a single animal or a group of animals (i.e., fish kills, flocks, or herds)?



Single animal



Group of animals

What is the age of the animal?

5.00

years

What is the weight of the animal?

25.00

lb



Did the animal die?



Yes



No



Unknown

What condition was the animal found in? (check all that apply)

☐ Alive

☐ Fresh

☐ Scavenged

☐ Decomposed

☐ Unknown

☒ Not Applicable

E- viro- me- tal Form

OHHABS - One Health Harmful Algal Bloom System

Go to: [All Reports](#) [Report Summary: MN_Report1](#)

Welcome, VRoberts

[Logout](#)



State Report ID: MN_Report1

Environmental Summary:

Water Body: Clearwater Lake

Author: JYu

Event Date: 8/15/2015

Report Summary:

State Report ID: MN_Report1

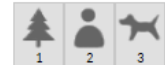
Status: Active

Water Body: Clearwater Lake

CDC Report ID: 5

Author: JYu

Date Created: 9/3/2015



General

Bloom Description

Laboratory Testing

Other Systems

Supplemental Info

Author and Agency

Dates

Geographic Description

Water Body Characteristics

Save

Date bloom was first observed

Date of notification to Local, Territory, Tribal, or State Health Authorities:

If no bloom date is available, select one below and explain in Date Remarks:

Date Remarks:

Report Summary

- ❑ New reports created with human or animal forms first will have an environmental form automatically created

OHHABS - One Health Harmful Algal Bloom System

Go to: [All Reports](#)

State ReportID: **MN_Report1**

Welcome, VRoberts

[Logout](#)

CDC Report ID: 5 Report Author: JYu Report Creation Date: 9/3/2015 Status: Active

View and Edit Report

	MN_Report1	State/Jurisdiction: Minnesota	Water Body: Clearwater Lake	Date Bloom Observed: 8/15/2015	Author: JYu	
	Hu1	Sex: M Age: 14	Location Name: Clearwater Beach	Date Illness Onset: 08/16/2015	Author: JYu	
	Hu2	Sex: F Age: 10	Location Name: Clearwater Beach	Date Illness Onset: 08/15/2015	Author: JYu	
	Dog1	Type of Animal: Dog	Single Animal	Date Illness Onset: 08/15/2015	Author: JYu	
	Duck Kills	Type of Animal: Bird	Group of Animals	Date Created: 09/03/2015	Author: JYu	
	Fish Kills	Type of Animal: Fish	Group of Animals	Date of Discovery: 08/18/2015	Author: JYu	

Actions:

Create New Form:



OHHABS and NORS

- ❑ **OHHABS reports**
 - ❑ Event-based reporting by states
 - ❑ Human and animal cases of illness and HAB events
 - ❑ Waterborne and foodborne HAB exposures
- ❑ **HAB outbreaks will continue to be reported in NORS**

OHHABS

On-line Health Harmful Algal Bloom
System
(Single human & animal cases)

NORS

National Outbreak Reporting System
(≥ 2 human cases)

Co- clusio-

❑ O- e Health surveilla- ce

- OHHABS will be able to li- k huma- a- d a- imal ill- ess data with HAB eve- ts
- Health surveilla- ce for HAB-related ill- ess relies more tha- traditio- al i- fectionous disease or huma- ill- ess surveilla- ce part- erships

❑ Capacity exte- ds beyo- d a- electro- ic system

- Resources, tools, relatio- ships, educatio- , a- d outreach
- Future database li- kages to optimize data use

❑ Data to i- form Great Lakes restoratio- efforts, mitigate health effects of HABs, a- d preve- t ill- esses

- e.g., beach ma- ageme- t, policy, commu- icatio- s a- d educatio- al materials

Thank You!

For more information

- Virginia Roberts (evl1@cdc.gov)
- Joana Yu (jyo3@cdc.gov)

1600 Clifton Road NE, Atlanta, GA 30333

Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

Visit: www.cdc.gov | Contact CDC at: 1-800-CDC-INFO or www.cdc.gov/info

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Division of Foodborne, Waterborne, and Environmental Diseases



Extra slides



What is the OHHABS pilot?

- ❑ **An opportunity for HAB working group states to evaluate the reporting process and needs**
 - **State public health agencies reserve the right to grant access to OHHABS. New users must get approval from their state's NORS Reporting Site Administrator (RSA) about OHHABS access**
- ❑ **An opportunity for federal partners to see the system through demonstrations and provide feedback**
- ❑ **Pilot goals:**
 - **Refine forms, HAB event, human case, & animal case definitions**
 - **Inform and develop training and guidance for reporting partners**
 - **Identify and prioritize OHHABS needs**
- ❑ **Pilot (August 2015) → Full Launch (Spring 2016)**

Required Fields i- OHHABS

- ❑ **Necessary identifiers for the report and forms**
 - State Report ID- 50 character max (e.g. alphanumeric, symbols)
 - Form Type (e.g. E- viral, Human, Animal)
 - Case ID-50 character max (e.g. alphanumeric, symbols)
- ❑ **Auto-populate fields in report and form summaries**
- ❑ **Minimal - number of fields**
- ❑ **Unique to each form**
 - E- viral (i.e. dates, state)
 - Human (i.e. dates, exposure state)
 - Animal (i.e. dates, exposure state, single or group of animals)

Rules of Behavior



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CDC 24/7: Saving Lives, Protecting People™

OHHABS - One Health Harmful Algal Bloom System

Rules Of Behavior

Welcome, JYu_CDC

[Logout](#)

Rules of behavior for the National Outbreak Reporting System (NORS) provide general instructions on the appropriate use of NORS and apply to any persons with a NORS user account. All users are required to read this document and confirm acceptance before access to NORS is granted. The NORS rules of behavior do not replace existing policy. Rather, they supplement standard security policies. Written guidance cannot cover every contingency, therefore NORS users should augment the rules of behavior using their best judgment and highest ethical standards to guide their actions. These principles are based on federal laws, regulations, and directives. There are consequences for failure to comply with the rules of behavior. Violation of these rules may result in suspension of access privileges and criminal and civil penalties. CDC NORS administrators may periodically monitor both the system and user activities for purposes including, but not limited to, troubleshooting, performance assessment, usage patterns, indications of attack or misuse, and the investigation of a complaint to suspected incident. Users are provided system access for the purpose of facilitating federal, state, local, and agency public health missions. Users should not have an expectation of privacy in anything created, processed, sent, received, or stored in NORS or in any action performed while using NORS resources. By signing this document, users consent to authorized system monitoring and acknowledge that CDC and/or reporting site administrators may, as directed or required by law, share collected information with management and/or law enforcement personnel. Users who do not comply with the prescribed rules of behavior are subject to penalties that can be imposed under existing policies and regulations, including suspension of system privileges and criminal prosecution.

☐ I have read the above document and agree to the Rules of Behavior

Continue

E- viro- me- tal Form – Geographic Descriptio-

General	Bloom Description	Laboratory Testing	Other Systems	Supplemental Info	Author and Agency
---------	-------------------	--------------------	---------------	-------------------	-------------------

Dates

Geographic Description

Water Body Characteristics

Save

Location
(For foodborne intoxication, report where food was caught/harvested)

State/Jurisdiction: Counties (select all that apply):

Aitkin
Anoka
Becker
Beltrami
Benton
Big Stone
Blue Earth
Brown
Carlton

Did an algal bloom impact water quality in any other states?

☐ Yes ☒ No ☐ Unknown ☐ Not applicable

Other states (select all that apply):

Select State(s)
CDC
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut

Official Name of Water Body: Common Name of Water Body:

Specific location name: Nearest city/town:

Location Coordinates:

☐ Degrees Minutes Seconds (ex. DD MM SS) ☐ Decimal Degrees (ex. 12.345678)

E- viro- me- tal Form – Health Advisories/War- i- g

OHHABS - One Health Harmful Algal Bloom System

Go to: [All Reports](#) [Report Summary: MN_Report1](#)

Welcome, VRoberts

[Logout](#)



State Report ID: MN_Report1

Environmental Summary:

Water Body: Clearwater Lake

Author: JYu

Event Date: 8/15/2015

Report Summary:

State Report ID: MN_Report1

Status: Active

Water Body: Clearwater Lake

CDC Report ID: 5

Author: JYu

Date Created: 9/3/2015



General

Bloom Description

Laboratory Testing

Other Systems

Supplemental Info

Author and Agency

Health Advisories/Warning

Observational Data

Save

Advisory or Warning Type

Response

Issuing Agency (if applicable)

Criteria/Reason(s) for issue

Start Date

End Date

Delete Row

Water body closure (recreational activity)

Yes

Yes

DNR

Visible bloom

8/15/2015

8/26/2015

Add Row

Huma- Form – Exposure I- formatio-

OHHABS - One Health Harmful Algal Bloom System

Go to: [All Reports](#) [Report Summary: MN_Report1](#)

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Human Case ID: Hu1

Human Case Summary:

Sex: Male

Author: JYu

Age: 14

Date Created: 9/3/2015

Report Summary:

State Report ID: MN_Report1

CDC Report ID: 5

Status: Active

Author: JYu

Water Body: Clearwater Lake

Date Created: 9/3/2015



General

Human Exposure Info

Illness and Outcomes

Clinical Testing

Supplemental Info

Author and Agency

Exposure Description

Activities

Exposure Routes and Remarks

Save

State(s) where exposure occurred? (select all that apply):

Select state(s)
CDC
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut

Count(ies) where exposure occurred? (select all that apply):

Aitkin
Anoka
Becker
Beltrami
Benton
Big Stone
Blue Earth
Brown
Carlton

Setting(s) of the exposure:

Select Setting(s) of exposure
Apartment/Condo
Beach - Nonspecific
Beach - Private
Beach - Public
Camp/Cabin Setting
Club (Requires Membership)
Community/Municipality
Farm/Agricultural Setting

Specific location name:

Clearwater Beach

OHHABS Pilot: HAB Defi- itio-

Table 1. Definition of a HAB environmental event

Definition	Criteria		
HAB Environmental Event	Laboratory-based HAB data ¹	Observational or environmental data ²	Associated illness
1. Suspect		Required to have 1	
2. Confirmed	Required		
3. Confirmed		Required	Required

¹ Laboratory detection (e.g. microscopic confirmation or DNA analyses) of cyanobacteria, other potentially toxin-producing algae, or algal/cyanobacterial toxins in a water body or finished drinking water supply

² Observational (e.g. scum, algae, water color change, sheen, photographic evidence, satellite data) or environmental (e.g. pH, chlorophyll, nutrient levels) data from a water body to support the presence of an algal bloom

Blue shaded cells: you must have at least one of the criteria described in the shaded cell.

OHHABS Pilot: HAB Human Illness Definition

Table 2. Definition of a Human HAB-associated case

Definition	Criteria							
	Exposure ¹	Signs/symptoms ²	Public health assessment ³	Professional medical diagnosis ⁴	Other causes of illness ruled out	Observational or environmental data ⁵	Laboratory-based HAB data ⁶	Clinical data ⁷
Human HAB-associated Case								
1. Suspect	Required	Required	Required					
2. Probable	Required	Required	Required			Required to have 1		
3. Probable	Required	Required	Required	Required	+/-	+/-	+/-	
4. Confirmed	Required	Required	Required	Required to have 1		+/-	+/-	Required
5. Confirmed	Required	Required	Required	Required	Required		Required	

¹ Exposure (i.e. physical contact, inhalation, ingestion) to water, algae, or seafood, dietary supplements

² Self-reported signs/symptoms after exposure

³ Public health assessment is defined as the action of compiling all data available and deciding that the illness in question is likely HAB-related

⁴ Professional medical diagnosis being provided by a medical practitioner (e.g. doctor, nurse, physician assistant) based on his or her medical assessment of the patient's symptoms, medical history, exposure, etc.

⁵ Observational (e.g. scum, algae, water color change, sheen, photographic evidence, satellite data) or environmental (e.g. pH, chlorophyll, nutrient levels) data from a water body to supporting the presence of an algal bloom

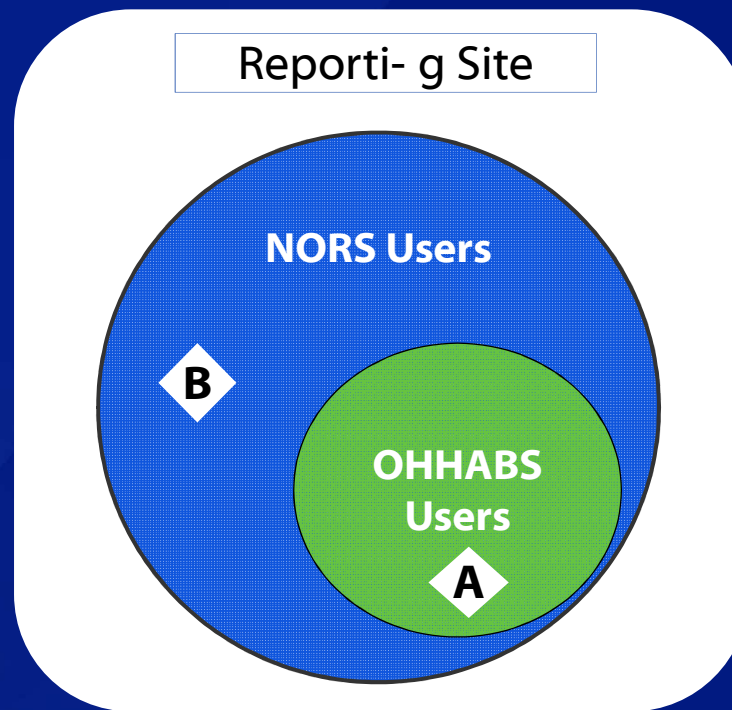
⁶ Laboratory detection of cyanobacteria or other potentially toxin-producing algae, (e.g. microscopic confirmation or DNA analyses) or algal/cyanobacterial toxins (e.g. bioassay, HPLC) in a water body, finished drinking water supply, seafood or dietary supplements

⁷ Laboratory documentation of cyanobacteria, other potentially toxin-producing algae, or algal/cyanobacterial toxins in a clinical specimen

Blue shaded cells: you must have at least one of the criteria described in the shaded cell.

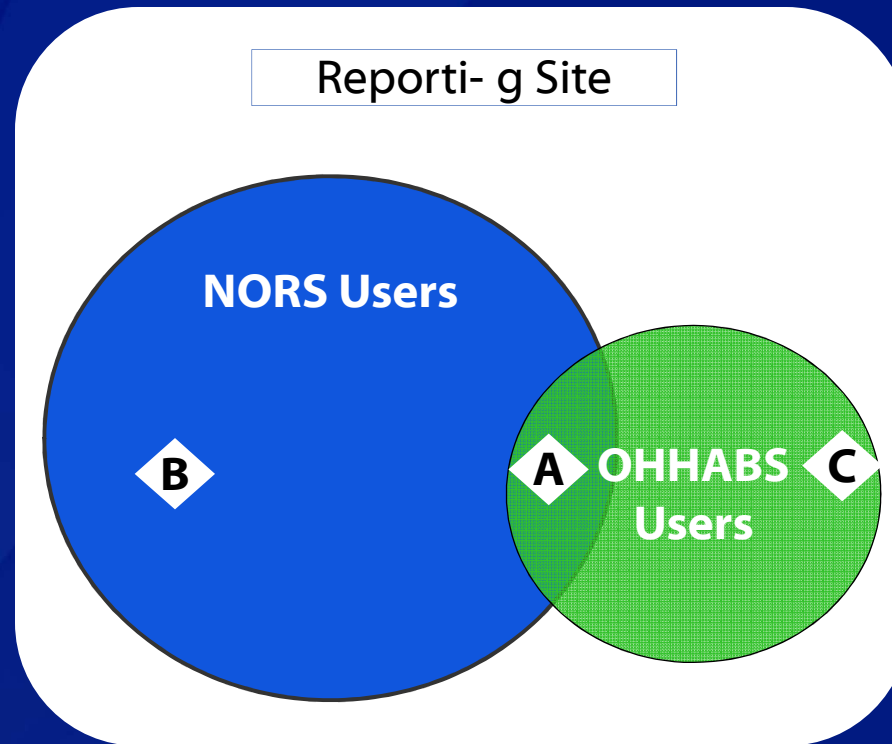
+/-: indicates that this criteria is optional and while it strengthens the case, but it does not change case classification (e.g. suspect to probable, probable to confirmed).

Current OHHABS access



User	System Access	Description
A	Both NORs and OHHABS	User A can access both NORs and OHHABS
B	Only NORs	User B can access NORs but not OHHABS

Future OHHABS access



User	System Access	Description-
A	Both NORS and OHHABS	User A can access both NORS and OHHABS
B	Only NORS	User B can access NORS but not OHHABS
C	Only OHHABS	User C can access OHHABS but not NORS

Harmful Algae

❑ Harmful Algal Bloom (HAB)

- A proliferation of microscopic organisms found in water that release or contain toxins or otherwise adversely affect humans, animals, and ecosystems – may or may not be visible

❑ Impacts

■ Public health

- Animal
- Human
- Exposure pathways: ingestion (water or food), inhalation, dermal contact

■ Ecologic

■ Economic

❑ One Health issue



- Photography credits
(From top: Andy Reich, Lorrie Backer)